

SIEMENS

SIREMOBIL Compact / L

SP

Image quality quick test

SIREMOBIL Compact L
SIREMOBIL Compact as of
Serial Number 02001

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System identification

Part No.:	_____	Serial No.:	_____
Cust./Clinic:	_____		
Address:	_____	City:	_____
Country:	_____	State:	_____
Telephone No.:	_____	Cont. person:	_____
System No.:	_____	Branch:	_____
Responsible system engineer: _____			

Image quality acceptance performed completely in the factory and documented by:

Name (block capitals): _____ Department: _____
Signature: _____ Date: _____

Date of installation of the system at the customer's site: _____

Image quality quick test performed in connection with:

Turnover to customer:
Maintenance:

Adjustments deviating from standard due to:

Country-specific regulations Special customer request
Reason: _____

Name (block capitals): _____ Regional office: _____
Signature: _____

Required measuring instruments and devices

- Set of X-radiation filters 10 x 0.3 mm Cu e.g. 44 06 120 RV090
- 2.1 mm Cu precision X-radiation filter 99 00 598 XE999
- 25 mm Al spacer, Type 26765 acc. to DIN 6868 Part 50
 - or
 - 1.2 mm Cu from the radiation filter set 97 98 596 G5321 and
 - 17 µm Cu - strip 11 67 662 G5247
- Set of resolution test patterns 28 71 820 RE999
 - Factory: Resolution test Type 41a
- Densitometer e.g. X-Rite 331 97 02 416 Y1996
 - or PTW-BC21 including Black-Check
 - Type 5321 and Light box Type 53213
- TV dynamic range test kit 37 90 156 X1963
 - or 97 50 001 X1963
- contains:
 - TV dynamic test 37 90 164 X1963
 - Heart contour diaphragm 37 90 172 X1963
 - Capillary test 37 90 180 X1963
 - Holder 87 13 901 X1963
 - Lead step test 87 09 743 X1963
- Protective conductor meter e.g. Safety Tester Unimet 1100 51 38 727 Y0766
- Service PC
- Service Software SIREMOBIL Compact
- Service PC-SIREMOBIL serial interface cable 99 00 440 RE999
 - or 96 60 978 RE999

Test requirements

- The entire system must be functioning properly; in addition, make sure that the
 - grid,
 - X-ray I.I. cover, and
 - Sirephos cover (without DHHS spacer) are installed.
- If the nominal values are not attained, the system must be adjusted or repaired according to the service instructions.
- Mark the appropriate boxes y/n with "y" for yes or "n" for no.

Parameters of the organ program for performing the IQ quick test

- Corresponding to the following table, in each case one of the available organ programs has to be programmed temporarily for the existing operating modes.
- Note the parameter values in the organ programs previously and reprogram them after completion of the IQ quick test.
- Perform programming according to the operating instructions of the system.
- Perform the tests in chapters 2 to 6 with the programmed values stated in the table.

NOTICE

All parameters in normal type correspond to the programming of the factory setting (default programming).
As long as the organ program 1 in the corresponding operating modes still corresponds to the factory setting, only the parameters marked with
*1 (for Memoskop CE /CE100 /C /C-SUB /C-SUB & MOD)
or
*2 (for Memoskop CX200)
need to be temporarily reprogrammed.

Organ program for performing the IQ quick test					
Operating mode	DL	IDL	DR	SUB	Roadmap
Program name	Standard	Standard	Standard	Standard	Standard
Doserate	MID	MID	MID *1	HIGH	HIGH
SIREMATIC normal	HC1 *2	HC1 *2	n.a.	n.a. (Iodine)	n.a. (Iodine)
SIREMATIC push	HC2	HC2	n.a.	n.a.	n.a.
Noise red. Low	MD1 *2 (K4:K1)	K = 4	K = 8	n.a.	n.a.
Noise red. High	MD2 (K16:K2)	K = 8	K = 16	n.a.	n.a.
Dose reduction low	n.a.	high	n.a.	n.a.	n.a.
Dose reduction high	n.a.	high *2	n.a.	n.a.	n.a.

Auto LIH disk transfer	NO	NO	n.a.	n.a.	n.a.
Auto transfer each image	n.a.	NO	n.a.	n.a.	n.a.
Disk transfer rate	0	n.a.	n.a.	n.a.	n.a.
Auto disk transfer	n.a.	NO	YES	n.a.	n.a.
Subtraction	n.a.	n.a.	n.a.	MAX	MAX
Landmark	n.a.	n.a.	n.a.	NO	NO
Video signal at docum.	n.a.	n.a.	n.a.	POS	POS
Image display	n.a.	n.a.	n.a.	POS	POS
Duration of the phase B1	n.a.	n.a.	n.a.	0 sec	n.a.
Disk transfer rate (Phase B1)	n.a.	n.a.	n.a.	0	n.a.
Disk transfer rate (Phase B2)	n.a.	n.a.	n.a.	3	n.a.

***1** MEMOSKOP CE / CE100 (C (C-SUB 7 C-SUB&MOD: Values of the parameters for performing the IQ quick test deviate from the standard programming of the organ programs (factory setting).

***2** MEMOSKOP CX200: Values of the parameters for performing the IQ quick test deviate from the standard programming of the organ programs (factory setting).

***3** Organ Program 1: Program name if Memoskop C-SUB / C-SUB&MOD is installed.

***4** Organ Program 1: Program name if Memoskop CX200 is installed.

Checking the ADR curves

Prerequisites

- When performing the following tests for the operating modes fluoroscopy, pulsed fluoroscopy and DR. program the parameters in accordance to the specification in chapter 1 , paragraph Test requirements.
- Attach the 2.1mm Cu precision radiation filter for prefiltration at the X-ray port on the tube assembly.
- Select "Mid" as the dose level; this corresponds to $0.220 \mu\text{Gy/s} \pm 15\%$ for a 17 cm I.I. with survey format or $0.185 \mu\text{Gy/s} \pm 15\%$ for a 23 cm I.I. with survey format.

Evaluation**NOTICE**

Check the ADR curves corresponding to those stated in chapter 1, Test requirements paragraph. If different ADR curves should be programmed at the customer's request, firstly program and test the curves stated in chapter 1, Test requirements paragraph, to make sure by comparison that nothing has changed in the system after delivery from the factory.

The curves available in the operating mode selected in each case can be selected with the  button.

ADR curves for fluoroscopy operating mode

- Test requirements: See chapter 1.
- Select  and image intensifier full image format.
- Select Sirematic HC 1 ADR curve; the LED of the  button is off.
- Radiation on.
- Read the indicated kV and mA values on the control panel.
- Radiation off.
- Enter the values in Tab. 1.
- Select Sirematic HC 2 ADR curve; the LED of the  button is on.
- Radiation on.
- Read the indicated kV and mA values on the control panel.
- Radiation off.
- Enter the values in Tab. 1.
- The actual values documented in the factory must be reproduced at the application site. Permissible deviations: Tube voltage (kV) $\pm 1\text{kV}$, tube current (mA) $\pm 10\%$.

ADR curves fluoroscopy	Nominal values (Factory)		Actual values			
			Factory		Application site	
	KV	mA	KV	mA	KV	mA
Sirematic HC 1	63 - 68 KV	1.9 - 3.8 mA				
Sirematic HC 2	61 - 66 KV	2.1 - 4.7 mA				

Tab. 1

ADR curves for pulsed fluoroscopy operating mode

- Test requirements: See chapter 1.
- Select  and image intensifier full image format.
- Select Sirematic HC 1 ADR curve; the LED of the  button is off.
- Radiation on.
- Read the indicated kV and mA values on the control panel.
- Radiation off.
- Enter the values in Tab. 2.
- Select Sirematic HC 2 ADR curve; the LED of the  button is on.
- Radiation on.
- Read the indicated kV and mA values on the control panel.
- Radiation off.
- Enter the values in Tab. 2.
- The actual values documented in the factory must be reproduced at the site.
Acceptable deviations: Tube voltage (kV) $\pm 1\text{kV}$, tube current (mA) $\pm 10\%$.

ADR curves pulsed fluoroscopy	Nominal values (Factory)		Actual values			
			Factory		Application site	
	KV	mA	KV	mA	KV	mA
Sirematic HC 1	63 - 68 KV	1.9 - 3.8 mA				
Sirematic HC 2	61 - 66 KV	2.1 - 4.7 mA				

Tab. 2

ADR curves for DR operating mode

- Test requirements: See chapter 1.
- Select **DR** and image intensifier full format.
- Radiation on.
- Read the indicated kV and mA values on the control panel.
- Radiation off.
- Enter the values in Tab. 3.
- The actual values documented in the factory must be reproduced at the application site. Acceptable deviations: Tube voltage (kV) $\pm 1\text{kV}$, tube current (mA) $\pm 10\%$.

ADR curves DR	Nominal values (Factory)		Actual values			
			Factory		Application site	
	KV	mA	KV	mA	KV	mA
DR 850W	61 - 66 KV	2.7 - 6.5 mA				

Tab. 3

NOTICE

The dynamic test in conjunction with the Plexi capillary test is used to display small differences in contrast.

- **Test arrangement**

- Remove the 2.1 mm radiation filter from the beam path.
- Attach the dynamic test without the holder but with heart contour diaphragm and Plexi capillary test directly in front of the image intensifier input (Plexi capillaries close to X-ray image intensifier).

- **Prerequisites:**

- Test requirements: See chapter 1.
- Select FLUORO ( button) standard settings (refer to Appendix)
- Select Sirematic HC1. (LED in the  button is off.)
- Select full format.
- Select high noise reduction, the LED of the  button is off.
- Edge enhancement ( button) off.
- Select LUT 1.
- Switch on radiation and evaluate the live image.



- Evaluation of the monitor image

- **Nominal value**
The unmarked Plexi capillaries in Fig. 1a must be visible.
- Cross off Plexi capillaries in Fig. 1b that are not visible.

Nominal value

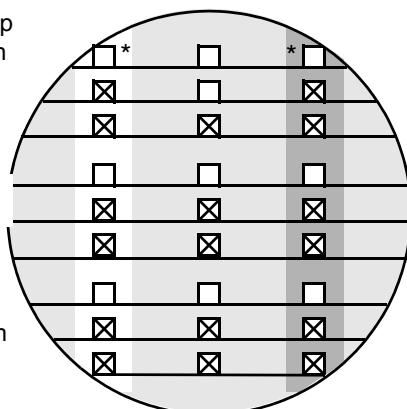


Fig. 1a

Factory

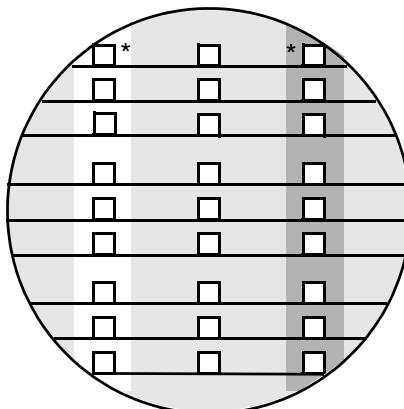


Fig. 1b

Application site

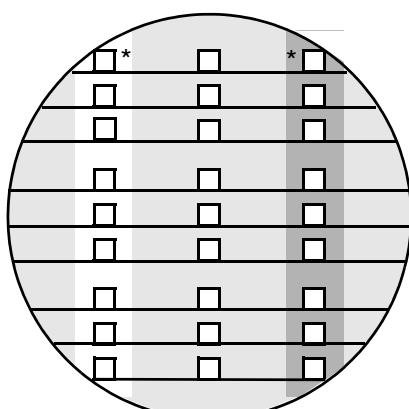


Fig. 1c

* Cannot be evaluated/not applicable for 17HDR-C image intensifier

Capillary test for Memoskop C-SUB, Memoskop C-SUB & Mod or Memoskop CX200 with option DSA

Memoskop C-SUB oder Memoskop C-SUB & Mod
or Memoskop CX200 is present:

y/n

If no, omit the capillary test for Memoskop C-SUB, Memoskop C-SUB & Mod or Memoskop CX200.

Subtraction mode

Measurement setup

- Attach the dynamic test without the holder but with the heart contour diaphragm and Plexi capillary test directly in front of the image intensifier input (Plexi capillaries close to image intensifier).

NOTICE

For 17 cm (7") image intensifiers, the upper line of the 3mm group can only be evaluated if the test is shifted slightly downward.

Prerequisites

- Test requirements: See chapter 1.
- Select SUB.
- Use the following settings:
 - Dose rate level "High" = $0.44 \mu\text{Gy/s} \pm 15\%$ for 17cm (7") I.I. or $0.37 \mu\text{Gy/s} \pm 15\%$ for 23cm (9") I.I..
 - Noise reduction for mask k = 32.
 - Noise reduction for fill k = 16.
 - SUB Phase A time 3 seconds.
- Select full format.
- Edge enhancement off.

Procedure



- Release the scene (radiation on).
- After ≥ 3 seconds, the mask is automatically placed. The "Inject" message appears on the monitor.
- Start the Plexi capillary test by pressing the rubber ball.
- Shut off radiation after 3 seconds.

Evaluation 1

- Select LUT 4.
- Find the capillary lines to be evaluated on monitor B in the individual matrix fields. They should be separated according to black and white.

NOTICE

Do not evaluate the first white line. Start the evaluation with the first black line.

- Enter the results in table 1 and table 2. If a line is not recognizable, identify it with x.

	Nominal values			Factory			Site			Group
	2L	1	5R	2L	1	5R	2L	1	5R	
Black										upper group 3 mm wide
Black			x							
Black	x	x	x							
Black										middle group 2 mm wide
Black		x	x							
Black	x	x	x							
Black										lower group 1 mm wide
Black			x							
Black	x	x	x							

Tab. 1

	Nominal values			Factory			Site			Group
	2L	1	5R	2L	1	5R	2L	1	5R	
White										upper group 3 mm wide
White		x	x							
White	x	x	x							
White										middle group 2 mm wide
White		x	x							
White	x	x	x							
White										lower group 1 mm wide
White			x							
White	x	x	x							

Tab. 2

Evaluation 2

- Evaluate the 3mm white capillary lines in the 2L, 1 and 5R fields on monitor B.
No obvious brightness differences should be visible between the fields.

No obvious brightness differences
are visible in fields 2L, 1 and 5R:

	Factory	Site	
<input type="checkbox"/>	y/n	<input type="checkbox"/>	y/n

- Evaluate the 3mm black capillary lines in fields 2L, 1 and 5R on monitor B.
No obvious brightness difference should be visible between the fields.

No obvious brightness differences
are visible in fields 2L, 1 and 5R:

	Factory	Site	
<input type="checkbox"/>	y/n	<input type="checkbox"/>	y/n

Roadmap Mode**Measurement setup**

- Attach the dynamic test without the holder but with the heart contour diaphragm and Plexi capillary test directly in front of the I.I. input (Plexi-capillaries close to image intensifier).

NOTICE

**For 17 cm (7") image intensifiers, the upper line of the 3mm group
can only be evaluated if the test is shifted slightly downward.**

Prerequisites

- Test requirements: See chapter 1.
- Select Roadmap.
- Use the following settings:
 - Dose rate level "Mid" = $0.22\mu\text{Gy}/\text{s} \pm 15\%$ for 17cm (7") I.I. or $0.185\mu\text{Gy}/\text{s} \pm 15\%$ for 23cm (9") I.I..
 - Noise reduction for phase 1 (K1) k = 16.
 - Noise reduction for phase 2 (K2) k = 8
 - Noise reduction for phase 3 (K3) k = 4
 - Roadmap Phase A time 3 seconds.
- Select full format.
- Edge enhancement off.

Procedure

- Release the scene (radiation on; Phase 1)
- After ≥ 3 seconds, the mask is automatically placed. The "Inject" message appears on the monitor.
- Do not shift the Plexi-capillaries. (radiation remains on; Phase 2)
- Shut off radiation after 3 more seconds.
- Release radiation again. (Phase 3)
- Start the Plexi-capillary test by pressing the rubber ball.
- Shut radiation off after 3 more seconds.

Evaluation

- Select LUT 4.
- Find the capillary lines to be evaluated on monitor B in the individual matrix fields. They should be separated according to black and white.

NOTICE

Do not evaluate the first white line. Start the evaluation with the first black line.

- Enter the results into table 3 and table 4. If a line is not identifiable, mark it with x.

	Nominal values			Factory			Site			Group
	2L	1	5R	2L	1	5R	2L	1	5R	
Black										upper group 3 mm wide
Black		X	X							
Black	X	X	X							
Black										middle group 2 mm wide
Black	X	X	X							
Black	X	X	X							
Black										lower group 1 mm wide
Black		X	X							
Black	X	X	X							

Tab. 3

	Nominal values			Factory			Site			Group
	2L	1	5R	2L	1	5R	2L	1	5R	
White										upper group 3 mm wide
White	X	X	X							
White	X	X	X							
White										middle group 2 mm wide
White	X	X	X							
White	X	X	X							
White										lower group 1 mm wide
White		X	X							
White	X	X	X							

Tab. 4

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- **Prerequisites:**

- Test requirements: See chapter 1.
- Attach the dynamic test without the holder but with the heart contour diaphragm and Plexi capillary test directly in front of the image intensifier input (Plexi capillaries close to the X-ray image intensifier).
- Select FLUORO
- Contrast setting for monitors - step 1 (LUT = 1)
- Edge enhancement = 0



Edge enhancement



- Switch fluoroscopy on briefly. The LIH image is visible on the monitor.
- Press the button for edge enhancement  several times.
The 2 levels of edge enhancement are selected consecutively. (Edge enhancement off - Edge enhancement stage 1 - Edge enhancement stage 2...)

Factory	Application site
---------	------------------

- Edge enhancement function test o.k.?
(The bright - dark transitions become clearly visible when selecting level 1 or 2)

y/n

y/n

Noise reduction



- Press the button for selecting the noise reduction factor; ; the LED of the button must light up (low noise reduction).
- Switch fluoroscopy on briefly and assess the noise impression of the image during radiation.
- Press the button for selecting the noise reduction factor; ; the LED of the button is off (high noise reduction).
- Switch fluoroscopy on briefly and assess the noise impression of the image with radiation on.

Factory	Application site
---------	------------------

- Noise reduction functioning o.k.?
Image noise is less with the LED of the  button off).

y/n

y/n

Motion detector

NOTICE

Perform this test only in the factory.

• Prerequisites:

- Test requirements: See chapter 1.
- Select FLUORO
- Select low noise reduction (MD1) ; the LED in the  button is on.
- In addition, place a screwdriver centrally on the dynamic test.
- Radiation "ON"
- When activating the key for image rotation, the live image shows only a slight trailing effect.

The image noise is more clearly visible in the moving parts of the image.

- Radiation "OFF"
- Select high noise reduction (MD2); the LED in the  button is out.
- Radiation "ON"
- When activating the key for image rotation, the live image shows a greater trailing effect than for low noise reduction.

The image noise is more clearly visible in the moving parts of the image.

- Radiation "OFF"
- Remove the screwdriver from the image intensifier.

- Evaluation of the monitor image.

Factory

- Motion detection o.k.?

y/n

(Trial effect vs. image noise)



Checking the resolution and the minimum contrast

- Prerequisites:

- Test requirements: See chapter 1.
- Select FLUORO and the "Mid" dose rate level.
- Select Sirematic HC1 ADR curves; LED of the  button is off.
- Set edge enhancement to optimum detection of resolution.
- Press the button for noise reduction ; the LED of the button must be off.
- Set the contrast (LUT) for the monitors to optimum recognition of resolution.
- Factory: Use resolution test Type 41 A.
- Application site: Use resolution text Type 41.

Attach the resolution test directly to the grid in the center of the image intensifier. It should be located at an angle of approximately 45° to the grid lines.

- Factory:

Attach 25 mm AL measuring stand to the image intensifier.

- Application site:

If a 25 mm AL measuring stand is present (with 0.4 mm notch) attach this close to the image intensifier.

Otherwise:

Attach the 17 µm Cu strip directly to the grid next to the resolution test and place an additional 1.2 mm Cu filtration in the beam path, close to the tube.

- If overframing occurs at the edge of the image intensifier, eliminate this with collimation.
- Switch radiation "ON". Determine the resolution of the LIH image and enter it in Tab 1.
- In each case, check that the minimum contrast is detectable. (Notch in 25 mm AL or 17 µm Cu strip.)

- Evaluation

- Determine the line pairs/mm and enter the value in table 1.

Operating mode	Image intensifier format	Nominal resolution values [Lp/mm]		Actual resolution values [Lp/mm]			
		7" (17cm)	9" (23cm)	Factory		Application site	
during radiation	Full format	≥ 1.4	≥ 1.2		n.a.		n.a.
during radiation	Zoom	≥ 2.2	≥ 1.6		n.a.		n.a.
LIH	Full format	≥ 1.4	≥ 1.2				
LIH	Zoom	≥ 2.2	≥ 1.6				

Tab. 1

Minimum contrast detectable ?

Factory

Full format:	<input type="checkbox"/>	y/n
Zoom:	<input type="checkbox"/>	y/n

Application site:

Full format:	<input type="checkbox"/>	y/n
Zoom:	<input type="checkbox"/>	y/n

The minimum contrast must always be visible.

NOTE

Perform this test only at the factory.

The following control systems are in operation with the indicated prefiltration:

ADR	at approx. 6 mm Cu and dynamic test in the beam path
Iris diaphragm	at approx. 8.1 mm Cu and dynamic test in the beam path
AGC	at approx. 11.1 mm Cu and dynamic test in the beam path

This test is used to check the operation of these control systems.

Prerequisites

- For SIREMOBIL Compact with 2 monitors, both must be set for approximately the same (synchronous) brightness and contrast (LUT, brightness and contrast setting).

Preparations

- Test requirements: See chapter1.
- Attach the dynamic test
 - without holder,
 - with heart contour diaphragm,
 - without Plexi capillary test to the image intensifier.
- Select FLUORO: dose rate level "Mid".
- Select Sirematic HC1 ADR curve; the LED of the  button is off.
- Select LUT1 for both monitors (if existing).
- Select edge enhancement at maximum detectability of bright/dark transitions.
- Switch X-ray image intensifier to full size.
- Open the collimator to maximum aperture.
- Prefilter with copper until 106 kV to 109 kV is displayed.
Switch fluoro on briefly (around 6 mm Cu required).
- Radiation ON.
- Evaluate the brightness of the fluoro image.
- Radiation OFF.



Evaluation 1

- Attach an additional 2.1mm Cu at the radiation output.
- Radiation ON;
The generator maximum 110kV / 3mA must be attained.
- Store the LIH image as reference image.
- Evaluate the brightness of the fluoro image.
- The brightness with approx. 6mm Cu prefiltration and dynamic test should be approximately equal to the brightness with 8.1mm Cu and the dynamic test.

Factory

Brightness with ADR and iris diaphragm controll the same?

 y/n
Evaluation 2

- Attach additional 3mm Cu to the radiation output.
- Radiation ON ;
- Evaluate the brightness of the fluoro image.
- The brightness with approximately 8.1mm Cu prefiltration and dynamic test (stored reference image) must approximately equal the brightness with approximately 11.1 mm Cu and dynamic test.

Factory

Brightness with ADR and AVR the same?

 yn
Programming the previous noted values of the organ programs**NOTE**

Before performing the IQ-Quick-Test, the organ programs were set in accordance to chapter 1, paragraph Test requirements.

These have to be reprogrammed to the previous noted parameter values.

Program the organ programs back to the original and previous noted parameter values.

Image artifacts

- Cross off all image artifacts which have been detected during setting and image quality tests in the table in the image quality test certificate.
- If any image artifacts are detected which are not listed in the table, these must be described under "Other artifacts".
- To evaluate the respective artifacts, there are three rating numbers which indicate the extent of each artifact:

Definition of the rating numbers

1 = No artifacts could be determined during start-up.

2 = A few artifacts occurred sporadically during start-up. The cause could not be located and the "error" could not be corrected. The artifacts do not negatively influence the overall appearance of the images and do not compromise the diagnostic value of the images in any way. The artifacts are determined to be tolerable.

3 = During start-up, artifacts occurred frequently or with greater severity and they negatively influenced the overall appearance of the images or compromised their diagnostic value. Therefore, the artifacts were determined to be intolerable and the system could not be turned over to the customer.

Description of the artifacts

- **Hum:**
Inhomogeneity caused by electro-magnetic fields in imaging systems. This artifact may significantly influence the diagnostic value of the images depending on the degree. Optimally, this artifact should not occur at all, however, extremely low levels can be tolerated. Hum artifacts appear as periodic, horizontal bright and dark structures in the image; they appear briefly and are not specific to one location.
- **Interference stripes**
Very high-frequency electro-magnetic fields appear in the image as bright or dark, sometimes very short, transverse marks in the image. They appear briefly. Stripes caused by contaminants on the surfaces of lenses, etc. should be included in this group. In this case, they are specific to one location and appear constantly. Stripes cannot be tolerated.
- **Ghosting:**
These artifacts are object contours displayed twice, with the second contour generally shifted laterally. They are caused by reflections in long, poorly adjusted video cables. Clearly visible ghosting cannot be tolerated.
- **Background structures** are stationary, grid-shaped patterns primarily in dark regions of the image. They are also referred to as "standing noise".
- **Pixel errors** are image pixels without image information. They are visible on the monitor as bright and black dots the size of pixels.

Some types of pixel errors can be tolerated while others cannot. The TV camera is carefully inspected with respect to pixel errors at the TV test bay prior to shipment. TV cameras can be turned over to the customer only if the number of pixel errors meets the

factory specifications. These pixel errors can be tolerated and must be documented in the IQ test certificate.

Image artifacts

Required value for the assessment of the artifact: Only 1 and 2 can be tolerated

Type of artifact	Factory			Start-up		
	1	2	3	1	2	3
Hum						
Interference stripes						
Ghost images (reflections)						
Background structures						
Pixel error						

*1 Rating number of artifact

- 1 = No artifacts
- 2 = Slight artifacts
- 3 = Disturbances that cannot be tolerated

Remarks: _____

Other artifacts:

Programming the organ programs

(Upon customer request only, at the application site.)

The customer has selected the standard organ programs:

y/n

If "y": omit this chapter.

SIREMOBIL Compact without keyboard

- Connect the service PC to the external service interface.
- Install the Memoskop service program on the service PC using the installation routine on the diskette.
The service diskettes are located in the Log book, Register 10.
- Call up the Memoskop service program and program the organ programs requested by the customer.
- Print out the programmed values using the print function in the Memoskop service program. Sign and date the printout and file it in the customer's copy of the operating instructions in the chapter on "Curves and Diagrams."

SIREMOBIL Compact with keyboard

The customer can change the organ programs himself using the operating instructions. The programmed parameters can be read out again by the customer after calling up "User Setup".

Checking the newly programmed ADR control curves

Prerequisites

The test of the ADR control curves Sirematic HC1 and Sirematic HC2 was already performed. Refer to chapter 2 of these instructions.

- Select "Mid" as the dose rate level. This corresponds to a dose rate of $0.22 \mu\text{Gy/s} \pm 15\%$ for a 17 cm (7") I.I. and survey format or $0.185 \mu\text{Gy/s} \pm 15\%$ for a 23 cm I.I. (9") and survey format.
- If required, program the dose rate levels in the organ programs temporarily to "Mid".

Procedure

- Select FLUORO .
- Attach a 2.1 mm Cu prefilter to the radiation output.
- After selecting the respective fluoro organ program and activating the  key, the programmed ADR control curves can be selected.
- Switch fluoro ON.



NOTICE

Note the programmed dose rate level. To check the newly programmed ADR control curves, temporarily program the "Mid" dose rate level (refer above).

Evaluation

- Read the kV and mA values displayed on the control panel and enter them for the associated ADR control curve in table 1.
- Switch fluoro OFF .
- Select any additionally programmed ADR control curves by selecting the corresponding organ programs and the  key and enter the kV and mA values in table 1.

ADR-Curve	Typical values		Actual values on-site	
	kV	mA	kV	mA
SIREMATIC LD	80 - 96	02 - 0.4		
SIREMATIC S1	67 - 79	0,9 - 1.5		
SIREMATIC S2	65 - 75	1.1 - 1.9		
SIREMATIC HC1	63 - 68	1.9 - 3.8		
SIREMATIC HC2	61 - 66	2.1 - 4.7		
IODINE	61 - 65	2.1 - 5.0		

Multispot 2000 present? y / n
If "n": chapter not applicable.

Since the Multispot 2000 must be optimally set for the film used and the development required at the user's site, only a functional test is performed at the factory.

Functional check at the factory

The functional check must be performed for all possible image subdivisions, in each case with positive and negative image display.

Definition: Positive image display means that the hardcopy image is identical with the monitor display.

Requirements

- Select Memory test image (Appendix).
- Set LUT to position 1.
- A camera warm-up period of 20 minutes must be observed.
- Select the image subdivision to be tested in each case.
- Select the image display (positive/negative) to be tested in each case.
- Set the relevant B, C, D values shown in Table 1:

	positive image display				negative image display			
	B	C	D		B	C	D	
			at 50 Hz refresh rate	at 60 Hz refresh rate			at 50 Hz refresh rate	at 60 Hz refresh rate
Multispot 2000 1/4, full format	008	550	035	042	020	660	035	042
Multispot 2000 1/4, 4-on-1 image	008	550	016	019	020	660	016	019
Multispot 2000-2	008	550	021	025	020	660	021	025

Tab. 1

- Enter the film type used and the emulsion number:

Film type: Kodak EKTASCAN DNB; Emulsion number: _____

- Enter the film density values measured in Table 2.

NOTICE

In the case of deviations from the nominal value 2 (film density 40%), B must be corrected (adjusted).

Mark the fields which are not applicable with n.a.

	Setting values factory function check			Film density		
	B	C	D		Nominal value	Factory
MS 2000 1/4 full image, negative image display				0% (1)	≤ 0.27	
				40% (2)	1.0 ± 0.3	
				100% (3)	≥ 2.4	
MS 2000 1/4 full image, positive image display				0% (1)	≥ 2.4	
				40% (2)	1.3 ± 0.3	
				100% (3)	≤ 0.27	
MS 2000 1/4 4-on-1 image, negative image display				0% (1)	≤ 0.27	
				40% (2)	1.0 ± 0.3	
				100% (3)	≥ 2.4	
MS 2000 1/4 4-on-1 image, positive image display				0% (1)	≥ 2.4	
				40% (2)	1.3 ± 0.3	
				100% (3)	≤ 0.27	
MS 2000-2, negative image display				0% (1)	≤ 0.27	
				40% (2)	1.0 ± 0.3	
				100% (3)	≥ 2.4	
MS 2000-2, positive image display				0% (1)	≥ 2.4	
				40% (2)	1.3 ± 0.3	
				100% (3)	≤ 0.27	

Tab. 2

Setting the multiformat camera at the customer's site

The setting must be performed for all possible image subdivisions, in each case with the image display (positive and/or negative) desired by the customer.

Mark the settings not performed with n.a. in the relevant table.

Definition: Positive image display means that the hardcopy image is identical with the monitor display.

- Film type used: _____ Emulsion number: _____
- Select Memory test image (Appendix).
- A camera warm-up period of 20 minutes must be observed.
- Set LUT to position 1.
- Start the setting procedure with the B, C, D values shown in Table 2.
- Select the image subdivision to be set in each case.
- Select the image display to be set in each case.
- Change B until the 40% gray level (see Fig.1) corresponds to the nominal value for the film density Dnom. (see Tables 3 to 6).
- Change C until the film density values for white and black correspond to the nominal values (see Tables 3 to 6).

When increasing the contrast values (C), ensure that the 100% fields and 90% fields and the 0% fields and 10% fields can be distinguished from one another.

Multispot 2000-2

Negative image display

- Enter the values determined in Table 3.
- Enter the values programmed for B, C, and D in Table 3.

Positive image display

- Enter the values determined in Table 4.
- Enter the values programmed for B, C, and D in Table 4.

Multispot 2000 1/4

Negative image display

Full-field image (1/1)

- Enter the values determined in Table 3.
- Enter the values programmed for B, C, and D in Table 3.

4-on-1 image (1/4)

- Enter the values determined in Table 5.
- Enter the values programmed for B, C, and D in Table 5.

Positive image display**Full-field image (1/1)**

- Enter the values determined in Table 4.
- Enter the values programmed for B, C, and D in Table 4.

4-on-1 image (1/4)

- Enter the values determined in Table 6.
- Enter the values programmed for B, C, and D in Table 6.

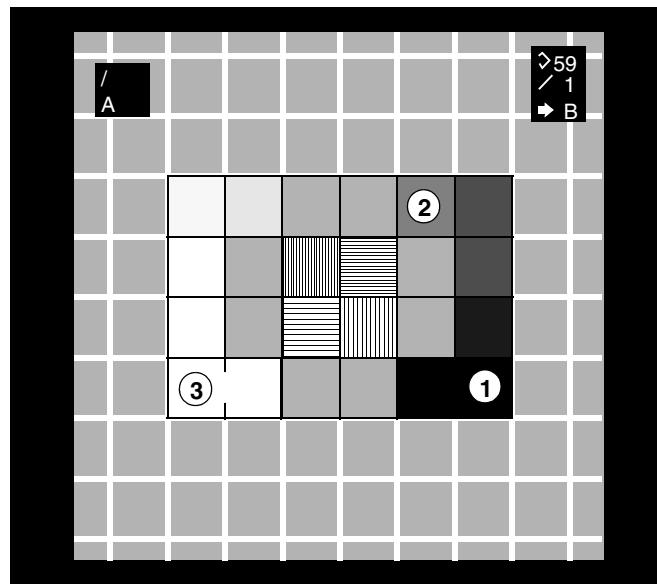


Fig. 1

Memory test image on the monitor [Film = Positive image display]

Application site:

Film density values for Multispot 2000-2 or Multispot 2000 1/4 with full-field image and negative image display:

Field	Film density nominal values D_{nom}	Film density D	Programmed values
0% (1)	≤ 0.25		B
40% (2)	1.0 ± 0.1		C
100% (3)	≥ 2.5		D

Tab. 3

Application site:

Film density values for Multispot 2000-2 or Multispot 2000 1/4 with full-field image and positive image display:

Field	Film density nominal values D_{nom}	Film density D	Programmed values
0% (1)	≥ 2.4		B
40% (2)	1.3 ± 0.1		C
100% (3)	≤ 0.25		D

Tab. 4

Application site:

Film density values for Multispot 2000 1/4 with 4-on-1 and negative image display:

Field	Film density nominal values D_{nom}	Film density D	Programmed values
0% (1)	≤ 0.25		B
40% (2)	1.0 ± 0.1		C
100% (3)	≥ 2.5		D

Tab. 5

Application site:

Film density values for Multispot 2000 1/4 with 4-on-1 and positive image display:

Field	Film density nominal values D_{nom}	Film density D	Programmed values
0% (1)	≥ 2.4		B
40% (2)	1.3 ± 0.1		C
100% (3)	≤ 0.25		D

Tab. 6

Checking the Multispot resolution

Prerequisites

- Select FLUORO (standard settings see Appendix)
 - Select Sirematic HC1 ADC control characteristic; the LED of the  button is off.
- Select image intensifier full format.
- Set contrast setting for monitor B to LUT 1.
- Factory: Resolution test Type 41A; Application site: Resolution test Type 41
- Fasten the resolution test at around 45 degrees inclined to the grid lines in the image intensifier center directly on the grid.
- **Factory:** Attach 25 mm AL measuring stand close to the image intensifier.
- **Application site:** With 25 mm AL measuring stand present (with 0.4 mm notch), attach this close to the image intensifier.
Otherwise: Fasten 17 μ m Cu next to the resolution test directly on the grid and attach 1.2 mm Cu in the beam path close to the tube.
- If overframing occurs at the edge of the image intensifier, mask this out.
- Switch radiation "on" and let it stabilize. Switch radiation "off".
- Transfer (store) the LIH image on monitor B.
- Select negative image display of the Multispot.



Multispot 2000-2



- Expose the film (both partial exposures) and develop it.
- Evaluate both partial exposures.
- Enter the lower resolution value in Table 7.

Resolution nominal values [Lp/mm] negative image display		Resolution actual values [Lp/mm] negative image display	
7" (17cm)	9" (23cm)	Factory	Application site
1.4	1.2		

Tab. 7

Multispot 2000-1/4

- Expose a film at full format.
- Evaluate the exposure.
- Enter the values determined in Tab. 7.
- Expose a film in 4-on-1 format (all 4 partial exposures).
- Evaluate all 4 partial exposures.
- Enter the lowest resolution value in Tab. 8.

Image format	Resolution nominal values [Lp/mm] negative image display		Resolution actual values [Lp/mm] negative image display	
	7" (17cm)	9" (23cm)	Factory	Application site
Full format	1.4	1.2		
4-on-1 format	1.4	1.2		

Tab. 8

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- If the SIREMOBIL Compact covers were removed, perform the protective conductor test in accordance with ARTD part 2 (CD-ROM).

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Calling up the Memoskop test patterns

Memoskop CE / CE100 / C / C-SUB / C-SUB & MOD with keyboard

You can call up Technical Setup for the memory by pressing CTRL + T.

Various test patterns can be called up from the first menu.

Memoskop CE without keyboard

- Connect the service PC to the external service interface.
- Install the Memoskop service program using the installation routine on the diskette. The service diskettes are located in the log book, Register 10.
- Call up the Memoskop service program in the "Test pattern generation" menu. Various test patterns can be called up from the menu.

Memoskop CX200

You can call up Technical Setup for the memory by pressing CTRL + T.

Various test patterns can be called up from the menu "8 Input Setup".

Standard programming

MEMOSKOP CE / CE100 / C / C-SUB / C-SUB & MOD

The organ programs are stated with their default values in the operating instructions of the SIREMOBIL Compact.

The following default values are programmed in organ program 1 when the SIREMOBIL Compact is delivered:

Organ program1					
Operating mode	FL	IFL	DR	SUB	Roadmap
Program name (*4)	Standard	Standard	Standard	Standard	Standard
Dose rate	MID	MID	HIGH	HIGH	HIGH
SIREMATIC normal	HC1	HC1	n.a. (DR850W*1)	n.a. (Iodine)	n.a. (Iodine)
SIREMATIC push	HC2	HC2	n.a. (DR850W*1)	n.a.	n.a.
Noise red. Low	MD1 (K4:K1)	K = 4	K = 8	n.a.	n.a.
Noise red. High	MD2 (K16:K2)	K = 8	K = 16	n.a.	n.a.
Dose reduction low	n.a.	high	n.a.	n.a.	n.a.
Dose reduction high	n.a.	high	n.a.	n.a.	n.a.
Auto LIH disk transfer (*2)	NO	NO	n.a.	n.a.	n.a.
Auto transfer each image (*2)	n.a.	NO	n.a.	n.a.	n.a.
Disk transfer rate (*2)	0	n.a.	n.a.	n.a.	n.a.
Auto disk transfer (*2)	n.a.	NO	YES	n.a.	n.a.
Subtraction (*3)	n.a.	n.a.	n.a.	MAX	MAX
Landmark (*3)	n.a.	n.a.	n.a.	NO	NO
Video signal at docum. (*3; *5)	n.a.	n.a.	n.a.	POS	POS
Image display (*3; *5)	n.a.	n.a.	n.a.	POS	POS
Duration of the phase B1 (*3)	n.a.	n.a.	n.a.	0 sec	n.a.
Disk transfer rate (Phase B1)(*3)	n.a.	n.a.	n.a.	0	n.a.
Disk transfer rate (Phase B2)(*3)	n.a.	n.a.	n.a.	3	n.a.

(*1) Observe a cool-down phase of 30s between 2 sequential DR exposures, otherwise, the ADR curve DR550W will automatically be selected.

(*2) For Memoskop C with hard disk only.

(*3) For Memoskop C-SUB or Memoskop C-SUB & Mod.

- (*4) The name is listed as an example only and can be any program name.
- (*5) Image display on film should correspond to image display on the monitor.

SUB & Roadmap	
Windows / Level	
/1 Brightness	100
/1 Contrast	195
/2 Brightness	105
/2 Contrast	205
/3 Brightness	110
/3 Contrast	215
/4 Brightness	115
/4 Contrast	225
/5 Brightness	120
/5 Contrast	235
/6 Brightness	127
/6 Contrast	245

SUB & Roadmap K-Factors / time	
SUB phase A K-Factor	32
SUB phase B K-Factor	MD2
SUB phase A time	45
Roadmap phase A K-Factor	32
Roadmap phase B K-Factor	MD2
Roadmap phase C K-Factor	MD2
Roadmap phase A time	45

MEMOSKOP CX200

The organ programs are stated with their default values in the operating instructions of the SIREMOBIL Compact / L.

The following default values are programmed in organ program 1 when the SIREMOBIL Compact is delivered:

Organ program 1					
Operating mode	DL	IDL	DR	SUB	Roadmap
Program name	Standard	Standard	Standard	SUB 2F/s	Standard
Doserate	MID	MID	MID	HIGH	HIGH
SIREMATIC normal	S2	S2	n.a.	n.a.	n.a.
SIREMATIC push	HC2	HC2	n.a.	n.a.	n.a.
Noise red. Low	K = 4	K = 4	K = 8	n.a.	n.a.
Noise red. High	MD2	K = 8	K = 16	n.a.	n.a.
Dose reduction low	n.a.	high	n.a.	n.a.	n.a.
Dose reduction high	n.a.	mid	n.a.	n.a.	n.a.
Auto LIH disk transfer	NO	NO	n.a.	n.a.	n.a.
Auto transfer each image	n.a.	NO	n.a.	n.a.	n.a.
Disk transfer rate	0	n.a.	n.a.	n.a.	n.a.
Auto disk transfer	n.a.	NO	YES	n.a.	n.a.
Subtraction (*2)	n.a.	n.a.	n.a.	MAX	MAX
Landmark (*2)	n.a.	n.a.	n.a.	NO	NO
Video signal at docum. (*2; *3)	n.a.	n.a.	n.a.	POS	POS
Image display (*2; *3)	n.a.	n.a.	n.a.	POS	POS
Duration of the phase B1 (*2)	n.a.	n.a.	n.a.	0 sec	n.a.
Disk transfer rate phase B1 (*2)	n.a.	n.a.	n.a.	0	n.a.
Disk transfer rate phase B2 (*2)	n.a.	n.a.	n.a.	2	n.a.

(*1) Observe a cool-down phase of 30s between 2 sequential DR exposures, otherwise, the ADR curve DR550W will automatically be selected.

(*2) For Memoskop CX200 with Option 5000 Images + DSA only.

(*3) Image display on film should correspond to image display on the monitor.

SUB & Roadmap	
Windows / Level	
/1 Brightness	3120
/1 Contrast	1600
/2 Brightness	3280
/2 Contrast	1680
/3 Brightness	3440
/3 Contrast	1760
/4 Brightness	3600
/4 Contrast	1840
/5 Brightness	3760
/5 Contrast	1920
/6 Brightness	3920
/6 Contrast	2032

SUB & Roadmap K-Factors / time	
SUB phase A K-Factor	16
SUB phase B K-Factor	8
SUB phase A time	15
Roadmap phase A K-Factor	16.
Roadmap phase B K-Factor	8
Roadmap phase C K-Factor	8
Roadmap phase A time	15

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All chapters	Revision revised
Chapter 1	Required measuring instruments and devices revised Test requirements revised.
Chapter 2 bis 6	Test requirements revised.
Chapter 8	Descriptions for Memoskop CX200 added.
Chapter 10	Descriptions for Memoskop CX200 added.
Chapter 11	Descriptions for Memoskop CX200 added.
Chapter 12	Revised

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